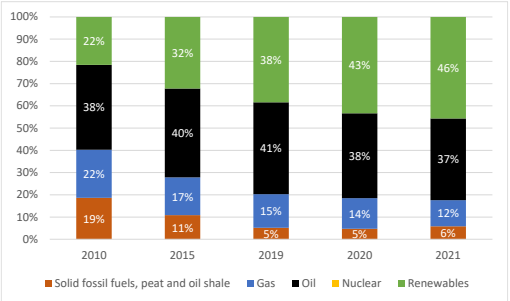
State of the Energy Union 2023 Denmark

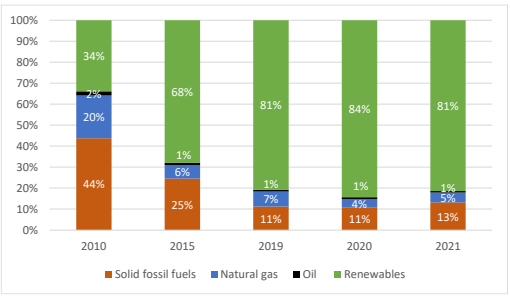
Key energy figures

Graph 1: **Energy mix**



Source: Eurostat

Graph 2: **Electricity mix**



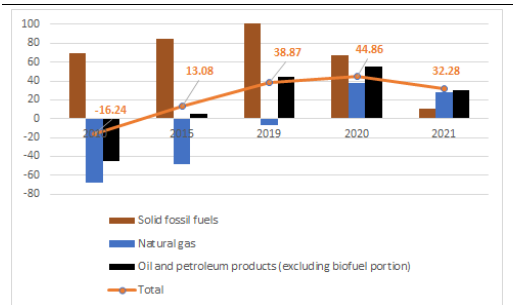
Source: Eurostat

- In terms of its energy mix, Denmark is a **frontrunner in the uptake of renewable energy**, serving as an important source of inspiration at European level. Although Denmark is taking rapid action on decarbonisation, in 2021 fossil fuels still accounted for 56% of its energy mix.
- In 2021, Denmark regained its position as the **country with the greenest electricity mix** in the EU-27 with over 80% generated by renewables. Wind power alone generates almost half of the country's electricity mix.

Security, solidarity and trust

1. DIVERSIFICATION OF ENERGY SOURCES AND REDUCTION OF IMPORT DEPENDENCY

Graph 3: **Import dependency on fossil fuels**

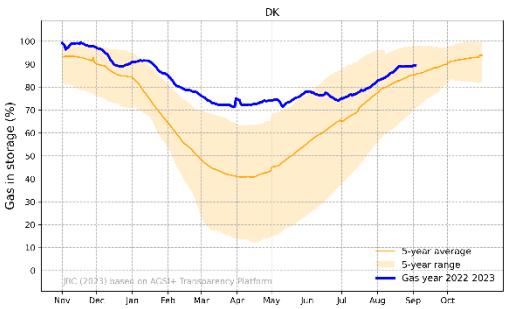


(1) In percentages (%)
(2) Combustible renewables and electricity are excluded
(3) The total amount takes into consideration the energy mix of the country
Source: Eurostat

- Before Russia invaded Ukraine, Denmark had **no exposure to direct gas imports from Russia** but was exposed through exports via Germany.
- The Danish **electricity system is already very much centred on renewable energy**, with further investments in flexible solutions are in the pipeline.
- Denmark is committed to **phase out oil and gas based electricity** and aims for 100% renewable power generation by 2030.

2. FLEXIBILITY OF THE ENERGY SYSTEM

Graph 4: **Gas storage levels**



Source: JRC calculation based on AGSI+ Transparency Platform, 2023

- Denmark has **two underground gas storage facilities** with a total capacity of around **1 bcm**.
- On 16 October, the country's storage capacity was filled to **97.34%**.

Integrated internal energy market

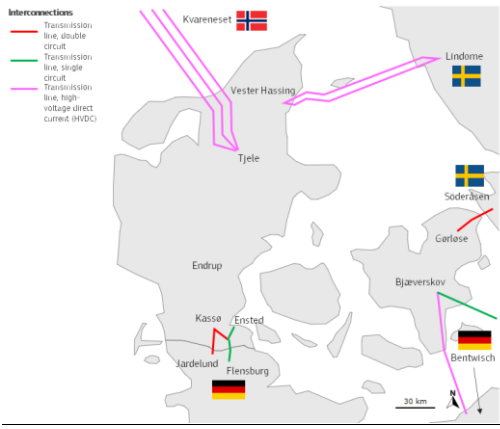
1. ELECTRICITY INTERCONNECTIVITY

2023	2030 target
41.32%	At least 15%

Source: DG ENER's own calculation based on ENTSO-E

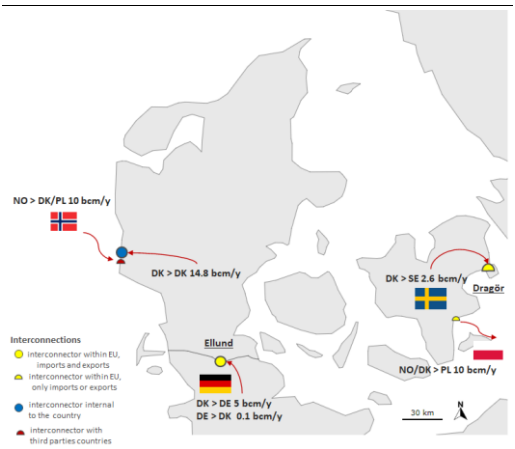
2. ENERGY TRANSMISSION INFRASTRUCTURE

Map 1: **Cross-border electricity interconnections**



Source: European Commission map recreation (based on ENTSO-E)

Map 2: **Cross-border gas interconnections**



Source: European Commission map recreation (based on ENTSO-G)

3. MARKET INTEGRATION

- No data available for index of concentration (HHI) in electricity and natural gas household markets in 2021 and 2022.
- Data regarding the market share of the three largest suppliers in 2022 is not available.

Rollout of electricity smart meters

- Denmark had a **high electricity smart meter rollout**, with 100% of household consumers being equipped with smart meters in 2022.

4. ENERGY POVERTY AND JUST TRANSITION

Table 1: **Energy poverty**

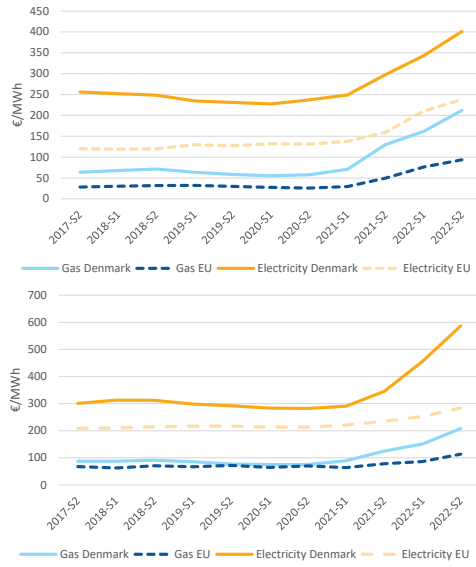
	Denmark			EU		
	2020	2021	2022	2020	2021	2022
Arrears on utility bills (households %)	4.2%	2.9%	3.5%	6.5%	6.4%	6.9%
Inability to keep home adequately warm (household %)	3.0%	2.8%	5.1%	7.5%	6.9%	9.3%
Population living in dwelling with presence of lead, damp and rot (population %)	16.8%	:	:	14.8%	:	:

Source: Eurostat

- **Just transition plan**: The Danish Territorial Just Transition Plans outline the plan to reduce carbon intensity of its industry in Northern Jutland, as well as the phase out of the oil and gas sector in Southern Jutland. The plans set out how the Just Transition Fund, with an allocation of €88 million will support green technology and business development, develop local carbon capture, use and storage value chains, business and technology development in energy storage.

5. ENERGY PRICES

Graph 5: **Energy retail prices for industry (top) and households (bottom)**

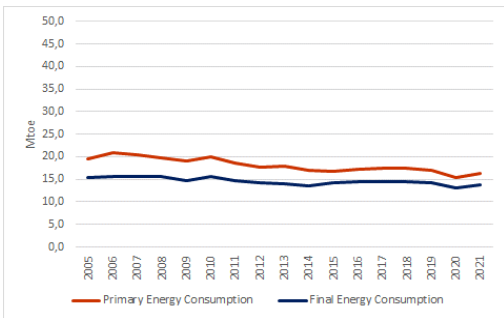


(1) On electricity, the band consumption is for DC households and ID for industry
(2) On gas, the band consumption is D2 for households and I4 for industry
Source: Eurostat

Energy efficiency

1. ENERGY EFFICIENCY

Graph 6: **Primary and final energy consumption**

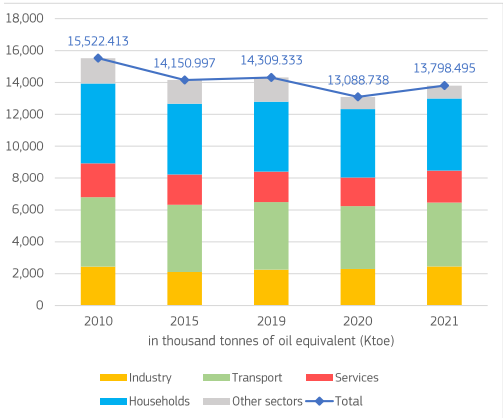


Source: Eurostat

- In 2021, Denmark's **Primary Energy Consumption (PEC)** amounted to 16.37 Mtoe, 3% lower than in 2019, while its **Final Energy Consumption (FEC)** amounted to 13.8 Mtoe,

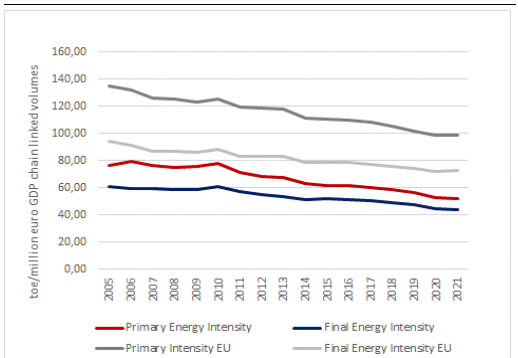
3.6% lower than in 2019, despite the COVID-19 crisis recovery.

Graph 7: **Final energy consumption per sector**



(1) Final energy consumption excludes consumption of the energy sector (including transformation and distribution losses) and non-energy use of energy carriers.
Source: Eurostat

Graph 8: **Primary and final energy intensity**



Source: Eurostat

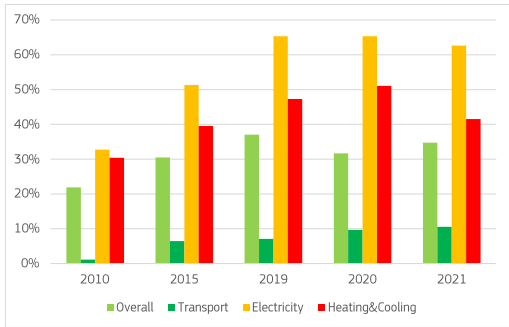
2. ENERGY SAVINGS IN BUILDINGS

- In 2020, there were **1.56 million** of **residential buildings** in **Denmark**.
- **Denmark did not set a 2030 target** in terms of **energy savings** in their 2020 Long Term Renovation Strategy (LTRS).
- In 2021, the final energy consumption of residential buildings **decreased by 4.59%** compared to 2019.
- The sales of heat pumps amounted to **88.833 units** in 2022 representing an increase of **20%** compared to 2021, as per the European Heat Pump Association (EHPA).

Decarbonisation and climate action

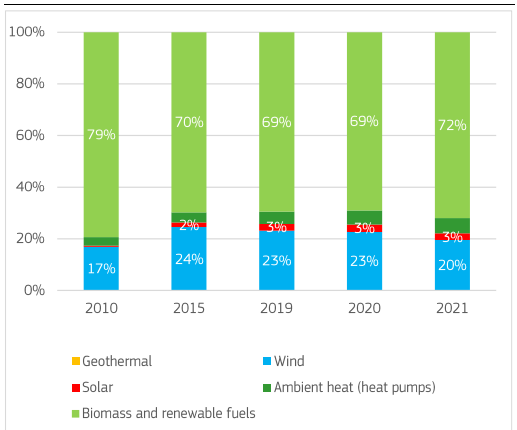
1. SECTORAL SHARE OF RENEWABLE ENERGY

Graph 9: **Share of renewable energy sources**



(1) In % of gross final consumption of energy
Source: Eurostat

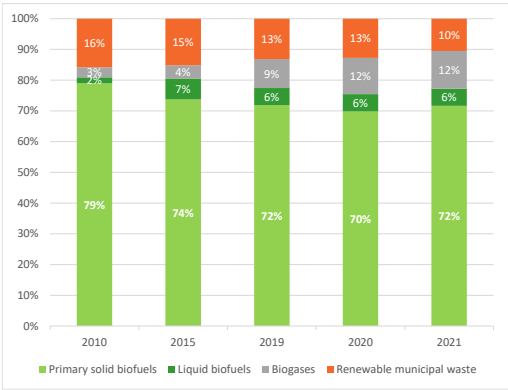
Graph 10: **Renewable energy mix**



(1) In % of gross final consumption of energy
Source: Eurostat

2. BIOENERGY DEMAND

Graph 11: **Bioenergy mix**

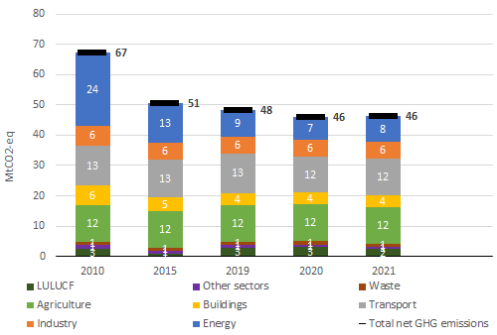


(1) Composition of bioenergy, in % of gross inland consumption of energy

Source: Eurostat

3. GREENHOUSE GAS EMISSIONS

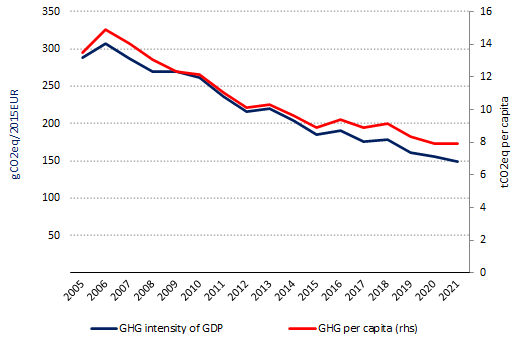
Graph 12: **Greenhouse gas emissions by sector**



(1) Energy sector refers to electricity and heat production and petroleum refining.
(2) Industry includes fuel combustion in manufacturing and construction and emissions in industrial processes and product use.
(3) Buildings include emissions from energy use in residential and tertiary buildings, and energy use in agriculture and fishery sectors.
(4) Total net GHG emission including LULUCF and excluding international aviation.

Source: EEA

Graph 13: **GHG per capita and GHG intensity of GDP**



(1) Total greenhouse gas emissions, including LULUCF and excluding international aviation.

Sources: Greenhouse gas inventory 1990-2021 (EEA). Real GDP in 2015-prices (AMECO, European Commission). Population (Eurostat).

- With 150 gCO2eq/2015EUR, Denmark lies below the EU average in terms of GHG intensity of GDP.
- With 8 tonnes of CO2 equivalent per capita, Denmark is slightly above the EU average in terms of GHG emissions per capita.
- For more detailed information on country profiles see Progress made in cutting emissions (europa.eu).

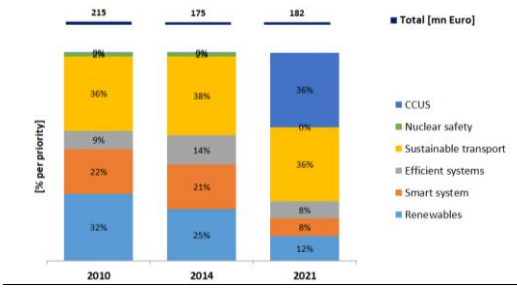
Research, innovation and competitiveness

1. INVESTMENT IN R&I

- Public investment in research and innovation (R&I) in Energy Union priorities[1] decreased from 0.066% in 2014 to 0.054% in 2021 (share of GDP).

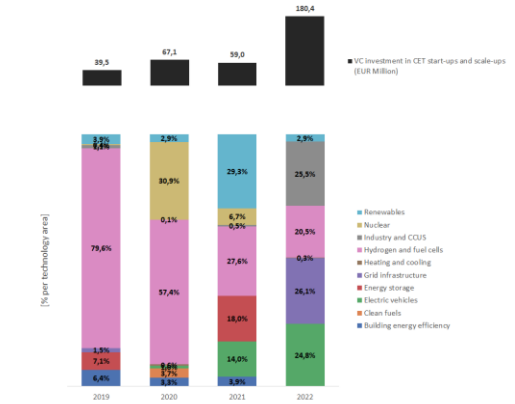
[1] Renewables, smart system, efficient systems, sustainable transport, CCUS and nuclear safety, COM(2015) 80 final ('Energy Union Package').

Graph 14: **Public investment in Energy Union R&I priorities**



Source: JRC SETIS 2023

Graph 15: **Venture capital investment in clean energy technology (start-ups and scale-ups)**

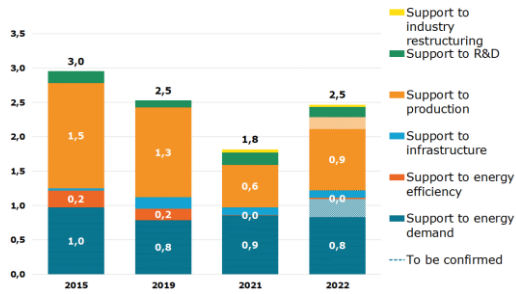


(1) Firms typically use venture capital to expand, break into new markets, and grow faster. Venture capital is essential for the growth of innovative firms and it is key to foster the EU's competitiveness and to strengthen the EU's technology sovereignty in the clean energy sector.

Source: JRC SETIS 2023

2. ENERGY SUBSIDIES

Graph 16: **Energy subsidies by purpose**

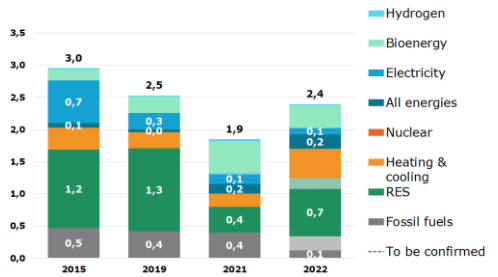


(1) Subsidies in EUR 2022 billion

(2) Some 2022 data were not fully available or validated at the time the study was completed (August 2023). For missing 2022 values, 2021 data were taken as a basis for an estimate. The estimated data are referred to as 'to be confirmed' in the graphs and indicated by hatching.

Source: Enerdata. Inventory of energy subsidies in the EU27 - 2023 edition

Graph 17: **Energy subsidies by carrier**



(1) Subsidies in EUR 2022 billion

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Source: Enerdata. Inventory of energy subsidies in the EU27 - 2023 edition

European Semester 2023

Country Specific Recommendation (Energy):

Reduce reliance on fossil fuels and increase the share of renewables in the energy supply. Address increasing demand and flexibility needs by incentivising the necessary electricity network developments at transmission and distribution level. Streamline the applicable permit granting rules for renewable energy. Implement additional measures that support energy efficiency in private and public buildings to reduce energy bills and

energy system costs. Ensure a better roll-out of decarbonised heating sources. Step up policy efforts aimed at the provision and acquisition of the skills needed for the green transition.[2]

For more information see the 2023 European Semester Country Report.

National Energy and Climate Plan (NECP)

- **The draft updated NECP** was submitted to the European Commission in June 2023.
- For more information see the dedicated webpage of the European Commission on the NECPs.

Recovery and Resilience Plan (RRP) and REPowerEU chapter

- **The Danish RRP was approved by the Council on 13 July 2021.**
- The implementation of the measures proposed in the RRP would allow Denmark to access **EUR 1.5 billion in grants**.
- **59%** of these funds are **allocated** for measures contributing to **climate objectives**.
- The Commission **disbursed so far EUR 503.14 million to Denmark.** A 1st payment request was disbursed on 27 April 2023.
- On 31 May 2023, Denmark submitted a **request to revise its RRP**, adding a **REPowerEU chapter**.
- The amended RRP takes into account the **revised RRF grant allocation** for Denmark – decreased to EUR 1.43 billion. It includes also the EUR 131 million **REPowerEU grant allocation** and EUR 66 million **voluntary transfer from the Brexit Adjustment Reserve**. The **total amount available** therefore is EUR 1.63 billion.
- For more information visit the Recovery and Resilience Scoreboard.

[2] Council of the European Union 9825/1/23